PB83-159384

EPA (Environmental Protection Agency) Evaluation of the Dynamix Device under Section 511 of the Motor Vehicle Information and Cost Savings Act

(U.S.) Environmental Protection Agency
Ann Arbor, MI

Aug 82

U.S. Department of Commerce
National Technical Information Service
NTIS

PB83-159384

EPA-AA-TEB-511-82-11

EPA Evaluation of the Dynamix Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act

by

Edward Anthony Barth

August 1982

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

Test and Evaluation Branch
Emission Control Technology Divison
Office of Mobile Sources
U.S. Environmental Protection Agency

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-AA-TEB-511-82-11		PB83 159384

4. TITLE AND SUBTITLE	5. REPORT DATE
EPA Evaluation of the Dynamix Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act.	August 1982
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Edward Anthony Barth	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
U.S. Environmental Protection Agency Office of Mobile Source Air Pollution Control Test and Evaluation Branch Ann Arbor, MI 48105	11. CONTRACT/GRANT NO.

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
	Technical
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This document announces the conclusion the EPA evaluation of the Dynamix device under the provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act. The evaluation of the Dynamix was conducted upon receiving an request from the inventor of the device. The Dynamix device is claimed to permit an unmodified conventional engine to operate efficiently on a blend of gasoline and hydrous ethyl alcohol. The ratio of gasoline to alcohol is selected by the operator. The device consists of an alcohol fuel storage and handling system, an alcohol/gasoline fuel proportioning valve, and an alcohol/heated air induction system. The Dynamix meters vaporized alcohol and hot air directly into the intake manifold of a vehicle. The flow of gasoline is controlled by the flow of alcohol.

EPA fully considered all of the information submitted by the applicant. The results of the evaluation based on the information available and EPA's engineering judgement is that the Dynamix device does not improve fuel economy, reduce emissions or provide an acceptable method of using an alternate fuel. In addition, the installation, adjustment, operation and maintenance of the Dynamix device will expose the installer or operator to serious safety hazards.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Automobiles Fuel Consumption Exhaust Emissions Ethy alcohol Gasoline Tests	Fuel Economy Gas Saving Devices	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release Unlimited	Unclassified	36
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

EPA Form 2220-1 (9-73)

EPA Evaluation of the Dynamix Device Under Section 511 of the Motor Vehicle Information and Cost Savings Act

The Motor Vehicle Information and Cost Savings Act requires that EPA evaluate fuel economy retrofit devices and publish a summary of each evaluation in the Federal Register.

EPA evaluations are originated upon the application of any manufacturer of a retrofit device, upon the request of the Federal Trade Commission, or upon the motion of the EPA Administrator. These studies are designed to determine whether the retrofit device increases fuel economy and to determine whether the representations made with respect to the device are accurate. The results of such studies are set forth in a series of reports, of which this is one.

The evaluation of the Dynamix device was conducted upon receiving an application for an evaluation from the inventor/marketer of the device. The device is claimed to permit an engine to operate efficiently on a blend of gasoline and alcohol. The device is an auxiliary fuel system.

The following is a summary of the information on the device as supplied by the Applicant and the resulting EPA analysis and conclusions.

1. Title:

   Application for Evaluation of Dynamix under Section 511 of the Motor Vehicle Information and Cost Savings Act

2. Identification Information:

   a. Marketing Identification of the Product:

      Dynamix (Alcogas Device/System)

   b. Inventor and Patent Protection:

      (1) Inventor

      Jose Ma. R. Concepcion
      #30 Melantic Street
      San Lorenzo Village
      Makati, Metro Manila
      Republic of the Philippines

      (2) Patent

      Republic of Philippines Patent 13218, U.S. Patent pending

   c. Applicant:

      Jose Ma. R. Concepcion
      #30 Melantic Street
      San Lorenzo Village
      Makati, Metro Manila
      Republic of the Philippines

d. Manufacturer of the Product:

(1) Philippines - Vulcan Industrial & Mining Corporation
Pioneer Street, Mandaluyong, Rizal
Republic of the Philippines

U.S. & International Market - Under Negotiation

(2) Chairman of the Board - Mr. Fred Velayo (representing the Herdis group of Companies)
President - Mr. Walter Brown
Vice-President - Annabelle P. Brown
Treasurer - Mr. Fred Ramos

Note: "The above are manufacturer/licensees of the device for the Philippines belonging only to Vulcan Industrial & Mining Corp."

3. Description of Product (as supplied by Applicant):

a. Purpose:

"An add on device for the conventional [internal] combustion engine (gasoline fed) to efficiently mix hydrous alcohol as low as 160 proof or even lower with regular gasoline in vapor form and in recommended proportions of 30% alcohol to 70% regular gasoline.

"Note: The device can however operate on a wider range of proportion including pure alcohol or pure gasoline, at the option of the motorist. The above add on device can efficiently use the above fuels on an unmodified engine."

b. Theory of Operation:

"While alcohol is considered as a leading source of alternative form of energy by reason of past utilization by several countries in the past, it is not without problems. Mainly the need to use waterfree alcohol (anhydrous 199.5 proof) to prevent phase seperation, which can cause deteriorated engine performance; cold starting problems; comparatively higher fuel consumption (than if you were to use pure gasoline); the high solvent action of alcohol causes fuel line impurities to get dislodged and clog up the carburetor jets to cause engine stalling, corrosion, and other undesirable factors. The aforestated, result from the traditional method of blending alcohol with gasoline in one fuel tank particularly in mixed fuel proportions higher than 20% alcohol to a proportionate amount of gasoline.

"Other Considerations:

(1) "Cheaper Fuel

"Furthermore, even on the assumption that there is troublefree operation in the traditional way of blending alcohol to gasoline, now more popularly referred to as "gasohol", the strongest deterrent in its widespread application throughout the world is the high cost of producing anhydrous alcohol, in view of the additional infrastructure required to dehydrate the alcohol as compared to the prevalent alcohol distilleries throughout the world producing 189 proof-alcohol. Additional distillation/dehydration columns have to be added to the conventional alcohol distillery producing 189 proof alcohol, not to mention the higher cost of operation due to more manpower and energy required to produce it. 160 proof alcohol is even cheaper to produce than 189 proof. The efficient utilization of this type of fuel alcohol alone can result in considerable savings.

(2) "Vaporization Thru Heat

"The high latent heat of alcohol requires a higher source of heat. To vaporize alcohol sufficiently, the heat source must be other than the fuel line or the heating of the incoming air thru the intake manifold. If you heat the fuel line of the alcohol, you will develop vapor lock and the engine will stall. If you heat the incoming air, you will dilute the fuel and air charge and reduce the volumetric efficiency and reduce the power output of the engine. The heat must therefore be supplied in a localized point to vaporize alcohol and yet not affect the two aforementioned factors affecting fuel delivery and the volumetric efficiency of the air/fuel charge.

(3) "Utilization of Waste Heat

"Likewise, the heat supplied should be inexpensive, not draining additional energy from the engine or the electrical system. Ideally then, it must utilize waste heat.

(4) "Supplying Air and Alcohol Fuel in Metered Quantities

"The need likewise exists to supply air and fuel alcohol in metered quantities into the intake manifold of the engine since an indiscriminate supply of either factor could adversely affect engine operation. A system must therefore be incorporated into the device/system that will supply fairly adequate supply of air and fuel alcohol in response to the varying needs of the engine at different RPMs. The device/system must therefore attempt to equal if not surpass the conventional carburetor which even in its present form is still an admittedly inefficient supplier of vaporized fuel and air in precise quantities at any given time of engine operation."

c. Construction and Operation:

"... the device/system operates as follows:

(1) "It utilizes 160 Proof alcohol. (Some road tests were conducted using as low as 140 proof.) This type of alcohol is much cheaper than 199.5 proof anhydrous alcohol.

(2) "Heated air coming from a heat exchanger with air supplied from the PCV and air cleaner passing thru [through] a small pipe, combine with finely sprayed alcohol in a vaporization chamber, just before the intake manifold. Heated air easily achieve temperatures of 120 degrees C and higher. Dynamometer tests show that this heat source does not deteriorate engine power. On the contrary, power is consistently improved, percentages of power increases varying with engine types. Superior vaporization have resulted in improved mileage, in such tests. Likewise, the fuel/air charge have not been diluted inasmuch as the increased volumetric efficiency improved the power. There have never been an instance of fuel line vapor lock throughout the dynamometer and extensive road tests.

(3) "A jacketed heat exchanger easily attached to the exhaust pipe immediately after the exhaust manifold heats up the air coming from the PCV and air cleaner before it is sucked thru the vaporization chamber where it combines with sprayed alcohol. The heat from the exhaust pipe is free. The system makes efficient utilization of the waste heat of the exhaust pipe to supply heat to the alcohol.

(4) "The air coming from the PCV has a PCV valve, and likewise with the air coming from the air cleaner. When there are no PCV valves, the system is supplied. Most motor vehicles are now provided with such PCV valves which supply additional air to the intake manifold in accordance with vacuum pressures and which are already calibrated by the various automotive/truck manufacturers into their respective engines. The device/system, simply makes use of the existing system of supplying additional air into the intake manifold, thus metering of the air is achieved.

"An accelerator valve directly coupled into the carburetor throttle valve controls the flow of fuel alcohol. The opening and closing of the accelerator valve is in conjunction with the opening and closing of the carburetor throttle valve. Likewise, fuel metering is achieved. Openings are adjusted in accordance with engine types and displacement, also bearing in mind the fuel to air ratios of the type of alcohol utilized." A drawing of the system is provided in Figure 1 of the Attachment B.

(5) "Manner of Operation - Basically, the system of operation is on the basis of dual fuel simultaneously fed into the combustion chamber in vaporized form. The conventional carburetor supplies gasoline in vaporized form into the combustion chamber in the usual manner. The alcohol fuel is vaporized thru this novel system of vaporization whereby the heated air combines with the fuel, and subsequently combines with gasoline, both of which fuels are in vapor form. They combine at a point just before the combustion chamber.

"The device therefore uses two kinds of fuels simultaneously, using two fuel tanks independent of each other using their respective fuel pumps, filters, and pass thru a metering device that proportionately meters the desired percentage of fuel passing thru it. The alcohol system follows the following sequence in liquid/vapor flow: From the fuel tank, the fuel passes thru the electric fuel pump which forces the fuel to flow to the engine, then thru a filter, the proportioning valve, the accelerating valve, the vaporizing chamber, and into the intake manifold in vapor form."

4. Product Installation, Operation, Safety and Maintenance (as supplied by Applicant):

a. Applicability:

(1) "In view of the systems utilization of the stock parts of the motor vehicle, virtually all gas-driven gasoline engines can be provided with the device."

(2) "The only inhibiting factor would involve the engine having no PCV valves. In such a case, the installer can make use of such valves provided for in the kit, and install same in the same manner and form as indicated in the installation manual.

"The kit comes in two sizes:

Type A - From, 1,000 cc to 3,000 cc engines
Type B - From 3,000 cc to 10,000 cc engines"

b. Installation - Instructions, Equipment, and Skills Required:

(1) Device Installation - General Instructions:

(a) "Installation of the alcohol fuel tank in the trunk of the motor vehicle or in any suitable place beside or opposite the fuel tank of pick-ups and trucks. In which case, the alcohol fuel tank should be strapped securely in the chassis in a manner similar to that of the conventional gasoline fuel tank."

(b) "The electric fuel pump should then be installed beside the fuel tank, preferably in the lowest level of the fuel tank immediately preceded by an in-line fuel filter. The level of the electric fuel pump should not be higher than 2 feet from the lowest level of the fuel tank."

(c) "The proportioning valve shall then be installed in a readily accessible place in the engine's firewall. The alcohol fuel line should be in series with the alcohol valve and the same series installation should be made with the gasoline fuel line. The cuts in the fuel line should be carefully made and connected with supplied rubber connectors." A drawing of the proportioning valve is provided in Figure 2 of the Attachment B.

(d) "From the proportioning valve, the alcohol fuel line proceeds to the accelerating valve or solenoid valve. The accelerating valve should be installed in conjunction with the accelerator pedal. The action should be the same as the action of the throttle valve. When the accelerator pedal is depressed, the connecting action on the accelerator should open the throttle valve of the carburetor. The same action should govern the opening and closing of the accelerating valve, which is normally connected to the carburetor by a bracket normally connected to the carburetor bolts in the base of the carburetor. The suitable and recommended installation is as follows:" A drawing of the accelerator valve and linkage is provided in Figure 3 of Attachment B.

(e) "Vaporizing Chamber - Most gas-driven motor vehicles are provided with an orifice in the intake manifold of the engine. In such a case, the plug is removed and the vaporization chamber is installed in its place. Where such an orifice is not present, the PCV line is connected in the intake manifold, the PCV line is removed and the vaporization chamber is installed in its place. The PCV line is then provided with a connector that is then connected in the air inlet side of the vaporization chamber." A drawing of the vaporizing chamber is provided in Figure 4 of Attachment B.

(f) "The heat exchanger is then attached to the exhaust pipe, in the closest and most convenient place after the exhaust manifold. The PCV line [is] connected by a tee connection from the air cleaner line, is then attached to the inlet side of the heat exchanger. The exit side of the heat exchanger is connected to the vaporization chambers' air inlet side. Please refer to the following diagram." A drawing of the heat

exchanger and heated air system is provided in Figure 5 of Attachment B.

(2) "Tools required for installation.

"In addition to the usual complement of small tools that most mechanics are provided, a set of tube flaring and cutting tools should be added."

(3) Equipment required to check accuracy of installation.

(a) "Vacuum gauge. 0 to 30 negative pressure and from 0 to 5 psi.

"The vacuum reading should be taken prior to the installation of the vaporization chamber. The vacuum gauge may be tapped to the vacuum line of the brake booster and a vacuum reading taken. Subsequently, another reading should be taken following the installation of the vaporization chamber. If only a small drop is shown in the reading, for instance, between 1 -2 atm. [psi] then the reading is normal. A greater amount of drop shows a leak in the system and all fittings and connections should be checked.

"On the positive pressure test of the vacuum gauge, to test the fuel line, the electric fuel pump should be activated. After bleeding the system free of all air, and a consistent pressure drop takes place, then the fuel line should be checked for leaks.

(b) "Flowmeter - to check the rate and flow of the fuel.

(c) "Pulse Indicators - All electric fuel pumps are provided with pulse indicators connected to the contact point and each opening and closing of the contact point is transmitted to an electric bulb or LED in the instrument panel. Depending on the distance of the electric fuel pump to the vaporization chamber, each pulsation can be calibrated in each vehicle by measuring the fuel volume by cc in relation to the pulsation of the electric fuel pump." A drawing of the wiring diagram is given in Figure 6 of Attachment B.

(4) "Adjustments to the Vehicle or Vehicle Systems as well as the Device Following the Installation.

(a) "The flowmeter should be attached to the gasoline line. The flowrate should then be monitored at a point just before the red-line* of the tachmometer (while the vehicle is in motion). After the flowmeter is disconnected, the flowmeter should be attached to the alcohol fuel line, and the alcohol flow should be adjusted to 30% of the gasoline flow rate previously taken a point close to the red-line of the tachometer. The adjustment should be made on the proportioning valve, at which point the accelerating valve should be inoperative.

(b) "The accelerating valve should be set in such a manner that the metering valve should be closed at idling speed. It should only start to open at approximately 1/10 of the total throttle linkage travel.

(c) "The electric micro switch should be similarly adjusted. It should only activate at a point 1/10 of the total throttle linkage travel.

(d) "The idling air should be slightly closed, to compensate for the additional air from two PCV valves. The distributor may likewise be slightly advanced to take advantage of the anti-detonation characteristics of alcohol. Generally upwards of about 2 degrees BTDC can be added depending upon the engine type and condition.

(e) "The system will still work effectively even without modifying the distributor."

(5) Skills Associated with the Installation of the Device

"A skilled mechanic with some knowledge of electrical wirings and the use of the vacuum gauge and flowmeter. Most 'week-end' mechanics with moderate knowledge of the above skills should likewise be able to manage."

c. Operation:

"After the engine has sufficiently warmed up, the system is activated by putting the power switch on, in the control box and which control box is normally placed in a convenient place in the instrument panel.

"This activates the electrical system which involves the electric fuel pump, accelerator switch, and the pulse (fuel flow) indicator.

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*Maximum allowable rpm recommended by the engine manufacturer.

"At idling speeds and very low RPMs, the system is not activated and only the normal gasoline flow takes place. Once the pedal is depressed, to place the vehicle in motion and at accelerating or cruising speeds, the alcohol system is activated. When decelerating or idling, the system is automatically deactivated.

"The heated air entry into the intake manifold is automatically regulated by the PCV valves additionally installed or is normally provided in the stock system. At low intake manifold vacuum pressures (as when accelerating or at cruising speeds) more air is admitted into the system. At high vacuum inlet manifold pressures, (as when idling) very little air is admitted into the inlet manifold.

"The amount of air admitted into the inlet manifold therefore varies in accordance with vacuum pressures and is fairly efficient air metering device, standard in most motor vehicles today.

"The bleeding of additional air into the inlet manifold (together with additional alcohol fuel) likewise reduces the air flow thru the carburetor and reduces the supply of vaporized gasoline extracted from the carburetor in proportion with the orifice size in the inlet manifold and the amount of air passing thru the orifice.

"Before putting out the engine, the alcohol system should be deactivated. However, no harm can take place even if it is inadvertently forgotten to be switched off."

d. Effects on Vehicle Safety:

"The only possible hazards involving the use of the device involve the escaping fumes of leaking alcohol from the fuel system. The human body's tolerance to alcohol fumes can be considered non-hazardous unless alcohol in considerable quantities is spilled in a sealed and non-ventilated passenger compartment. In which case, dizziness can occur. Such a possibility is however remote as the fuel system does not pass thru the interior of the motor vehicle [but] along the chassis [to where the] proportioning valve is attached to the firewall of the engine side.

"The air fuel system [is] contained in sealed lines, none of [these] components expose the alcohol fuel to the atmosphere."

e. Maintenance:

"Post Installation check-up should be made within 15 days or 500 kms. whichever comes first. It will involve the following:

Schedule I - Check for any air or fuel leaks
Schedule II - Check for the proper operation of the electric fuel pump

Schedule III - Check for any clogging of the fuel jets and clean same if necessary
Schedule IV - Check fuel filter and clean if necessary. Check calibration of alcohol fuel rate.
Schedule V - Check proportioning valve and accelerating valve for clogging or leaks and correct.

"Recommended Maintenance Schedule of the Device:

"Every 30 days or 1,500 Kms.	Every 90 Days or 3,000 Kms.	Every 120 Days or 4,500 Kms.
Sched. I & III	Schedule I to IV	Schedule I to V"

5. Effects on Emissions and Fuel Economy (submitted by Applicant):

a. Unregulated Emissions:

"Virtually all pollutants, HC, CO and even NOx are reduced. Even while low grade alcohol is used (160 proof), the efficient vaporization resulting from the combination of finely sprayed fuel with heated air (120 degrees [celsius] plus) reduce water vapor in even less quantities than those emitted in the operation of the automobile without the device.

"The only [problem that a] malfunction in the supply of alcohol will [cause is that it will] simply deactivate the entire system (malfunction of the electric fuel pump)."

b. Regulated Emissions and Fuel Economy:

No data was provided with the application. Limited data were supplied with the applicant's response, Attachment E, to EPA's request for additional information, Attachment D.

6. Analysis

a. Identification Information:

(1) Marketing Identification: In section 2a the applicant identified the device as the "Dynamix" (Alcogas device/system). In the cover letter accompanying the application, the applicant also referred to the device as the "Dynamix (alcohol/gasoline add on device)". The applicant's response, Attachment E, to EPA's initial request for additional information included test data for this device identified as "Alcogas dual flow device". All three identifications are variations of the name for the same device.

A related product for diesel engines was also referred to in the information submitted on the gasoline/alcohol device. This diesel/alcohol system was referred to as the Powerflo (alcodiesel device) and the alcodiesel dual flow device. No description of this diesel/alcohol device was provided.

(2) The applicant stated in Attachment E that an intake manifold adapter is provided when necessary to ensure that the alcohol entered the manifold at the center. Since there are many different configurations of carburetor bases, several different adapters (and thus model numbers) would be required. Therefore, the marketing identification of the device is judged to be incomplete.

(3) Inventor and Patent Protection: The original application did not include a copy of the patents. After reviewing the application, EPA requested, see Attachment D, a copy of the Republic of Philippines patent no. 13218 and U.S. Patent application covering the device. The applicant's response, Attachment E, did not include a copy of the Republic of Philippines patent. The applicant provided no response to a subsequent request, Attachment F for this patent. The only U.S. patent information supplied was a copy of the filing document for the U.S. Patent (Attachment A). This document provided no drawings or detailed description of the device.

(4) Applicant: The applicant was identified in Section 2c as Mr. Jose Ma. R. Concepcion. However, all correspondence received from the applicant was on stationery with a Tricontech Inc. letter head. Mr. Concepcion's position with Tricontech Inc. was not stated nor is there indication of this company's connection with the device.

b. Description:

(1) The primary purpose of the device is to allow a vehicle to efficiently operate on a blend of gasoline and hydrous ethyl alcohol. The important feature of this device is that the alcohol does not need to be water free since it is introduced in a vaporized form and the alcohol is contained in a separate fuel system. Normally, vehicles operating on a liquid fuel blend of gasoline and ethyl alcohol must use water-free alcohol to prevent phase separation (the water will separate out of the alcohol/gasoline mixture) and the problems associated with having liquid water in the fuel system. The alcohol may also attack parts of a standard fuel system.

The applicant also stated in Section 3b that the device would allow a vehicle to operate on a much wider range of fuel combinations - from only hydrous ethyl alcohol to only gasoline. EPA asked the applicant (Attachment D) if vehicles had been successfully operated over a wide range of fuel proportions and with what alcohols. The applicant replied (Attachment E) that vehicles had been satisfactorily operated with a wide range of gasoline/hydrous ethanol blends, but that the engines stalled during prolonged idle when operating only with 160 proof ethanol.

EPA also asked the applicant (Attachment D) if other alcohols could be used. Since the applicant did not respond to this question, it is not known if the device is able to operate properly with other alcohols.

(2) The theory of operation given in Section 3b adequately describes the problems encountered with the use of a gasoline/ethyl alcohol fuel blend and the approach the device takes to overcome these problems.

(3) The description of the device given in Section 3c does not adequately describe the Dynamix device. The description of the major components of the system is only given in general terms. However, a detailed description of the major components was not provided. EPA's request (Attachment D & F) for more details of the proportioning and accelerating valve was only partially answered by the applicant's one technical reply (Attachment E).

The description of the proportioning valve is not sufficient to show that is is actually able to function as claimed. The description does not specify how the device is able to control the flow of gasoline to be a fixed percentage (i.e., flow ratio) of the alcohol flow and how this flow ratio is readily adjustable by the operator.

The description of the "accelerating valve" was also inadequate. Although it was called an accelerating valve, it appears to be more properly an alcohol flow control valve that is opened and closed by the throttle linkage. It does not replace the function of the carburetor accelerator pump. The functioning of this valve is also questionable. The linkage adjustment procedures instruct the installer to adjust this valve so that it is shut off at idle and is open at engine red-line (while in gear) sufficiently to control the alcohol flow to be the desired alcohol/gasoline fuel ratio. Therefore, the alcohol flow is controlled to be a function of throttle position only, regardless of engine load, whereas, in an unmodified engine, gasoline flow is controlled to be a function of both load and rpm. Thus the engine could have either too much or too little of this gasoline/alcohol blend under all operating conditions.

An additional problem is that the normal supplemental carburetor circuits (idle, accelerator pump, and power enrichment) probably will not function normally due to the reduced flow of gasoline and air into the carburetor. The device appears to have no means to incorporate these necessary auxiliary carburetor functions into the alcohol system. The applicant did not respond to EPA's requests (Attachment D & F) for this additional information.

The applicant also states that " . . . the increase in alcohol fuel makes up for the energy lost by gasoline. However, quick and easy accelerating valve adjustments are necessary to effect this condition." (Attachment E) This implies that problems in obtaining the proper amount of fuel are readily overcome by the driver. However, since this valve is mounted under the hood, the operator is unable to readjust the fuel flow to current driving conditions while operating the vehicle.

The vaporized alcohol is introduced at any convenient hole in the intake manifold. This will cause uneven fuel distribution to the various cylinders if either the hole is not centrally located or there is uneven mixing of the vaporized alcohol and gasoline. EPA asked the applicant to comment on this mixing problem (Attachment D). The applicant's response indicated that he was aware of the problem and now uses a carburetor base plate adapter to allow the vaporized alcohol to be introduced at the center of the intake manifold (Attachment E). This approach will tend to make the fuel mixture more uniform. However, the applicant submitted no information that showed that good mixing and distribution actually occurred.

(4) The device is claimed to permit an existing vehicle to be modified to operate on a combination of alcohol and gasoline. However, there is no data that showed that modified vehicles had performed satisfactorily in normal usage.

(5) The cost of the device plus installation is not known. EPA's request for cost information (Attachment F) was not answered. Due to the lack of specific details about the device, EPA is also unable to estimate the cost or time required for installation of the device.

c. Installation, Operation, Safety and Maintenance:

(1) Applicability:

The applicability of the product, as stated in the application, to essentially all gasoline vehicles is questionable. Necessary carburetor baseplate adapters may not be made for all vehicles. Also, the fuel injection systems of most fuel injected gasoline vehicles would not function satisfactorily with these reduced gasoline flow rates.

(2) Installation - Instructions, Equipment and Skills Required:

The installation instructions for the device provide a generalized but reasonably complete description of how the device is to be installed. However, there are several major problems not addressed.

The device may not contain all the necessary components and parts. EPA asked the applicant if the accelerating valve, electric fuel pump, heat exchanger, carburetor adapter, hoses, fittings, wiring, etc. necessary for the installation were provided with the device (Attachment F) but received no response. If these components and parts are not provided, the installer would have to have a working knowledge of the system and expend considerable effort to acquire the required parts and to insure all components are compatible.

As stated only "... the usual complement of small tools that most mechanics are provided..." would be required for the installation. However, the proper adjustment will require a fuel flowmeter and possibly the use of a vehicle chassis dynamometer (Attachment E). A fuel flowmeter is not a normal mechanic's tool and a chassis dynamometer is a very expensive piece of specialized testing equipment. Few mechanics would even have access to these necessary items.

The adjustment procedures 4b(3)(a) require the engine fuel flow to be measured at engine redline while in gear. Besides the safety hazard and potential for engine/transmission damage this presents, it would be difficult to obtain the necessary measurements. The applicants response to EPA's concern about the safety of this procedure was that the procedure had been modified. The applicant stated that he now measures the flow rate with the vehicle on a chassis dynamometer and, by doing this for many representative vehicles, has developed a table of recommended flow rates for a given application. However, the applicant did not provide this table of recommended settings or provide the revised adjustment procedures. Even if this table were available it might not cover an individual's vehicle model or specific combination of vehicle and powertrain. Therefore an installer would either need access to a chassis dynamometer or have to revert to the potentially unsafe road procedure.

The applicant understates the skill level and knowledge required to install the device. Proper installation and adjustment of the Dynamix device will require above average mechanical skills plus a good understanding of the theory and operation of the device. It is unlikely most weekend mechanics or many professional mechanics will be able to properly and safely install and adjust the device.

(3) Operation:

The operation of the system presented by the applicant in Section 4c is that it is only necessary to switch the device on, after starting and the engine is warmed up, and then off prior to turning the engine off. However, in practice, operation of the system would require considerably more operator attention.

Since a vehicle with the device is dual fueled and will use large amounts of ethyl alcohol, the operator will need to provide storage and handling for the alcohol since it is unlikely to be located at a nearby service station.

The system does not provide an alcohol fuel gauge. Since a considerable amount of alcohol would be burned and running out would cause the engine to stop, a fuel gauge should be provided.

A feature of the system is the ability to choose different proportions of alcohol and gasoline. Although this can be accomplished by adjusting the control on the proportioning valve, to maintain a correct overall air/fuel ratio the accelerating valve linkage would also need to be readjusted. The user would have to develop the data to determine the proper new settings. These adjustments can only be performed when the vehicle is parked since the proportioning and accelerating valves are in the engine compartment.

(4) Effects on Vehicle Safety:

In Section 4d, the applicant identifies some of the safety hazards associated with the device and properly notes these identified hazards are minimal. However, he overlooked several hazards that are more serious and much more likely to occur.

Use of the device will require large amounts of ethyl alcohol. Unless alcohol is available at a service station, the operator of the vehicle will need to provide for the safe storage and handling of large amounts of a highly flammable liquid.

The routine maintenance checks will require partial disassembly of the alcohol fuel system in the engine compartment, thus presenting another safety hazard.

Finally, the installation adjustment procedure requires that the vehicle be operated at engine redline while in gear. Exceeding this engine rpm could lead to engine/drivetrain damage. Also, since it may be necessary to perform this adjustment procedure on the road while monitoring other system parameters, this procedure could cause accidents.

(5) Maintenance:

The maintenance schedule given in Section 4e is judged to be adequate. However, checking the items required will require partial disassembly of the system. Since these maintenance requirements occur quite frequently, every 30 days or 1500 kilometers, the vehicle operator will probably

need to be able to perform many of these checks. Checking the required items will require average mechanical skills, a working knowledge of the device, and the usual complement of mechanic's small tools.

d. Effects on Emissions and Fuel Economy:

(1) Unregulated Emissions:

The applicant submitted no test data and made no claims regarding unregulated emissions. The statements given in Section 5a relate to regulated emissions only.

An EPA sponsored study (1) showed that aldehyde emissions were relatively unaffected by the use of gasohol (gasoline with 10% ethyl alcohol). Also, there were no significant quantities of ethyl alcohol observed in the exhaust. A similar result could be expected for the Dynamix device when operating with a 10% alcohol concentration if the device functions as stated and is properly matched to the vehicle. The effects on unregulated emissions are unknown when operating the device with higher alcohol concentrations since vehicles tested with higher alcohol concentrations normally have had engine modifications.

(2) Regulated Emissions and Fuel Economy:

The applicant did not submit test data in accordance with either the Federal Test Procedure or the Highway Fuel Economy Test. These two test procedures are the primary ones recognized by EPA for evaluation of fuel economy and emissions for light duty vehicles(2).

The test data which was submitted consisted of a limited amount of fuel economy data for passenger cars on the road, steady state passenger car and light duty vehicle tests on a chassis dynamometer, and a heavy duty engine dynamometer test (Attachment D). This data did not substantiate the fuel economy claims for the device. Although emission benefits were claimed, no supporting data were supplied.

---

(1) "Gasohol, TBA, MTBE, Effects on Light Duty Emissions," EPA 460/3-79-012

(2) The requirement for test data following these procedures is stated in the policy documents that EPA sends to each potential applicant. EPA requires duplicate test sequences before and after installation of the device on a minimum of two vehicles. A test sequence consists of a cold start FTP plus a HFET or, as a simplified alternative, a hot start LA-4 plus a HFET. Other data which have been collected in accordance with other standardized procedures are acceptable as supplemental data in EPA's preliminary evaluation of a device.

The applicant was advised of our requirement that applicants submit appropriate test data to substantiate their claims. He was reminded of the test requirements and our obligation to publish the results of our evaluation (Attachments C, D, G, H, I, and J). Although he was given adequate time to comply, no further data or information was provided. Therefore, our evaluation was completed on the basis of the information available and EPA's engineering judgement.

EPA has performed only a limited amount of testing with gasolines containing ethyl alcohol. For 'gasohol', a blend of 10% ethyl alcohol in gasoline, EPA's test program showed that the expected result would be higher evaporative emissions, lower hydrocarbon and carbon monoxide emissions, and poorer fuel economy (3). However, because the applicant failed to provide valid test data or an adequate description of his device, it is impossible to determine if the Dynamix device would perform in a similar manner. The device uses a wide range of ethyl alcohol to gasoline ratios, is able to use hydrous ethyl alcohol, and uses a different fuel induction system.

7. Conclusions

EPA fully considered all of the information submitted by the applicant. The evaluation of the Dynamix device was based on that information.

The information supplied by the applicant was insufficient to adequately assess if the device would mechanically function as claimed. The applicant failed to respond to repeated requests for this additional information.

The limited fuel economy test data supplied were inconclusive. Although emission benefits were claimed, no supporting data were supplied. The applicant was advised by letter and by telephone on several occasions of EPA's requirement that applicants submit appropriate test data to substantiate their claims. Although he was given adequate time to comply, no further data or information was provided. Therefore, our evaluation was completed on the basis of the information available and EPA's engineering judgement.

The installation and adjustment, operation, and maintenance of the Dynamix device will expose the installer or operator to serious safety hazards.

---

(3) "Gasohol Test Program", EPA Test and Evaluation Branch report 79-4A. Part of the decrease in fuel economy is due to the fact that ethyl alcohol has a lower energy content than the gasoline it displaces.

The installation of the Dynamix device on a vehicle would require many hours and need to be done by a skilled mechanic who has had specialized training. Specialized tools and equipment would be needed for the post installation adjustments.

The applicant's concept of modifying vehicles to operate on a dual fuel system appears to be a potentially viable approach for operating a vehicle on a combination of gasoline and ethanol. However, without a detailed description of the device or valid supportive test data, there is no technical basis to support any claims that the Dynamix device improves fuel economy, reduces emissions, or provides an acceptable method of using an alternate fuel.

FOR FURTHER INFORMATION CONTACT: Merrill W. Korth, Emission Control Technology Division, Office of Mobile Sources, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, (313) 668-4299.

List of Attachments

Attachment A	Patent Application (provided with 511 Application)
Attachment B	Figures 1 through 6 (provided with 511 application)
Attachment C	Letter of September 23, 1981 to Jose Ma. R. Concepcion acknlowedging receipt of application.
Attachment D	Letter of September 30, 1981 from EPA to Jose Ma. R. Concepcion requesting clarification and additional information.
Attachemnt E	Letter of October 19, 1981 from Triconteck Inc. to EPA in response to EPA request.
Attachment F	Letter of November 19, 1981 from EPA to Jose Ma. R. Concepcion requesting clarification and information for items not fully covered by prior response (Attachment F).
Attachment G	Letter of January 11, 1982 to Jose Ma. R. Concepcion repeating request for information.
Attachment H	Letter of February 11, 1982 from EPA to Jose Ma. R. Concepcion repeating the request for information and allowing additional response time.
Attachment I	Letter of March 26, 1982 from EPA to Jose Ma. R. Concepcion providing copies of Attachments E, F, and G and advising applicant EPA was considering completing the evaluation with the information presently provided.
Attachment J	Letter of April 20, 1982 from EPA to Jose Ma. R. Concepcion notifying applicant that EPA would shortly close out the evaluation if inadequate test data and description of the device weren't provided.

Attachment A

Patent

The patent information provided with the application was a single page of a form which is used in the course of filing for a patent. This form contained no technical information about the device.

Similarly, the single page patent 'Notice of Allowance' provided as part of the Attachment D contained no technical information about the device.

Therefore, neither of these documents is provided as attachments to this evaluation.

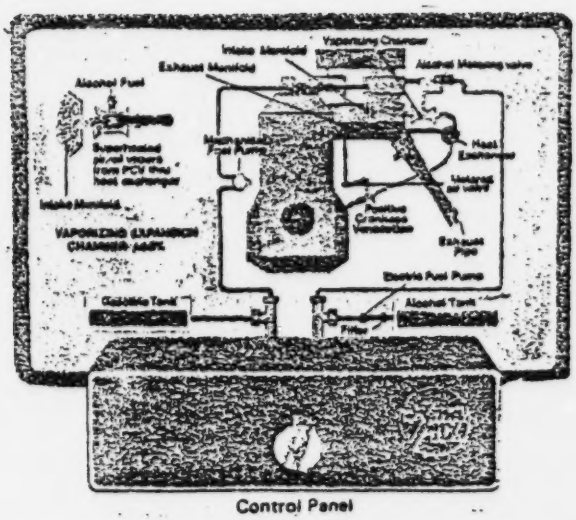

Figure 1 Dynamix System

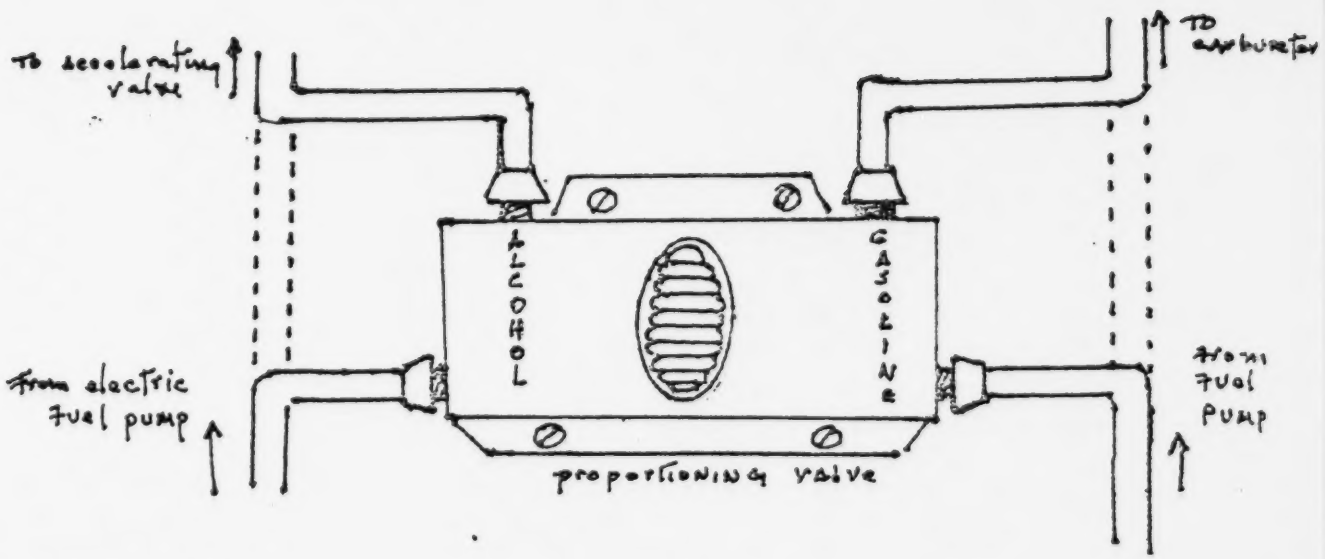

Figure 2 Proportioning Valve

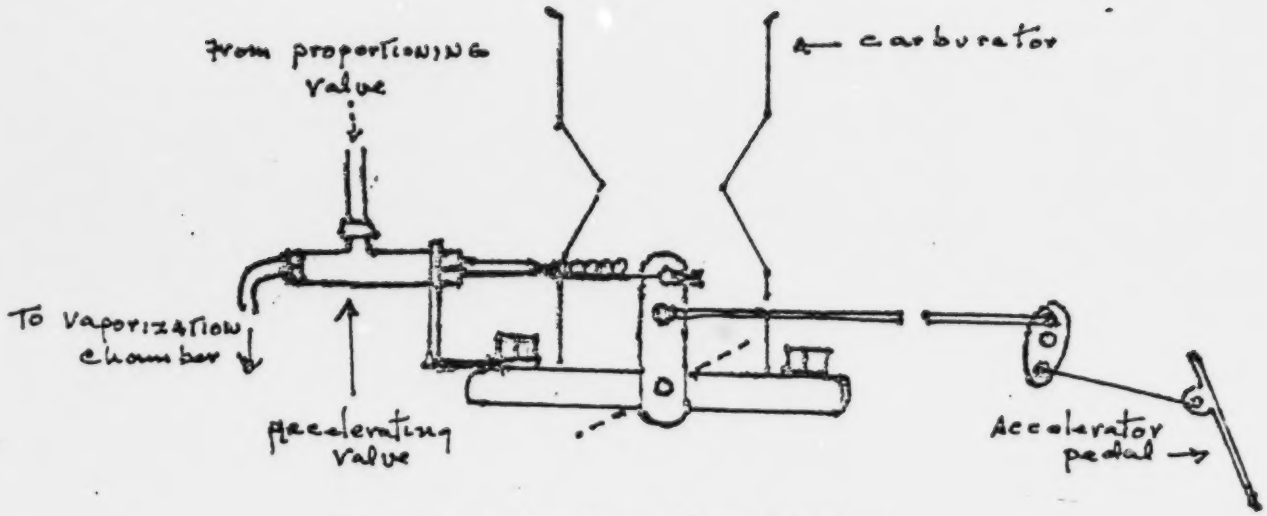

Figure 3 Accelerator Valve and Linkage

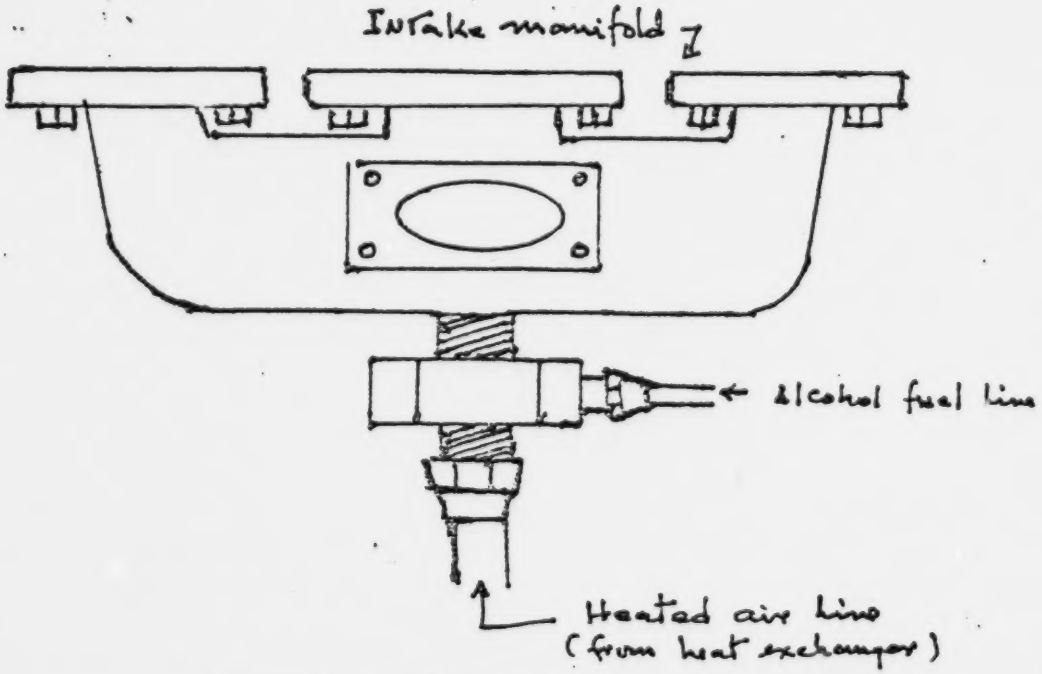

Figure 4 Vaporization Chamber

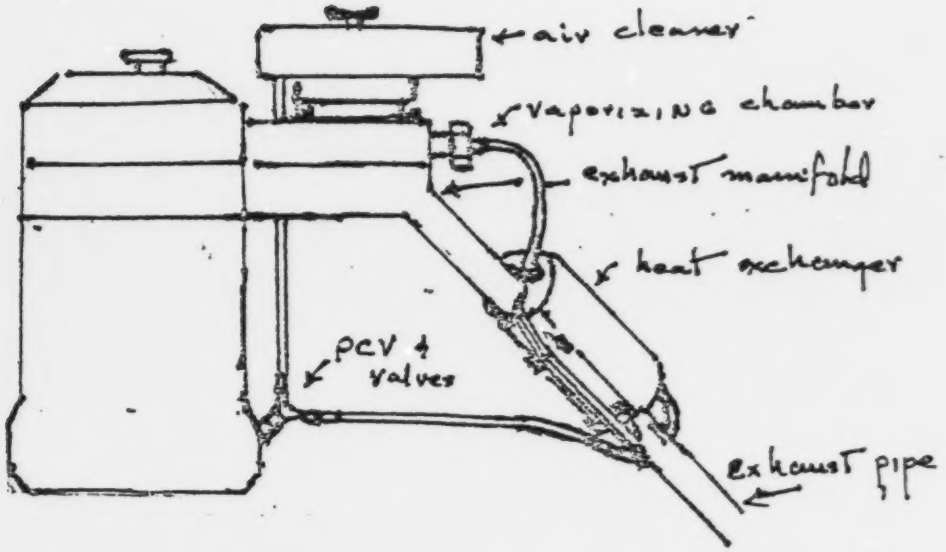

Figure 5 Heat Exchanger and Heated Air System

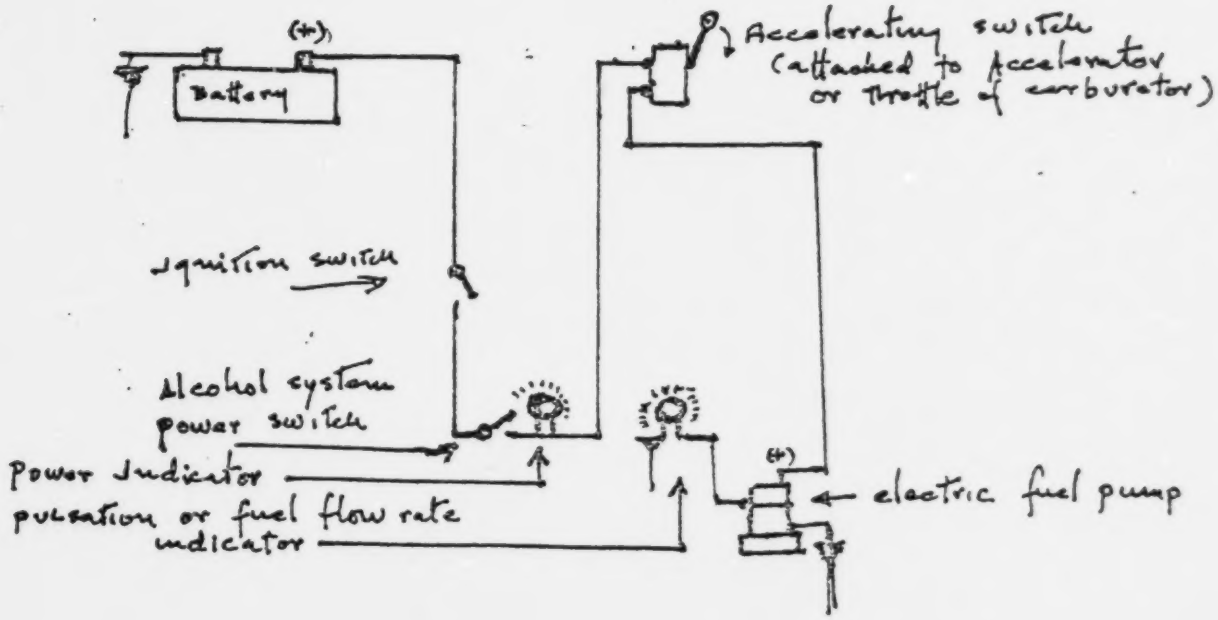

Figure 6 Wiring Diagram for Dynamix

Attachment C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR MICHIGAN 48105

OFFICE OF
AIR AND WASTE MANAGEMENT

September 23, 1981

Mr. Jose Ma. R. Conception
Triconteck, Inc.
The Manila Hilton, Suites 120 to 135A
United Nations Avenue
Ermita, Metro Manila
Philippines

Dear Mr. Conception:

We have received your application for an EPA evaluation of the "Dynamix" device. Our evaluation group is making a preliminary evaluation of the information that you enclosed and we will contact you in the near future concerning the next actions to be taken.

If possible, when you visit North America during November, we would welcome your visiting the EPA Laboratory in Ann Arbor, Michigan to discuss your device and the EPA evaluation process. We would like to work with you in designing a plan to test your device at an independent laboratory here in the United States.

If you could telephone me when you arrive at the Mexico trade fair, we can work out final arrangements for your visit to Ann Arbor. My phone number is (313) 668-4299.

Sincerely,

Merrill W. Korth

Merrill W. Korth, Device Evaluation Coordinator
Test and Evaluation Branch

cc: J. White
511 file "Dynamix"

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR MICHIGAN 48105

OFFICE OF
AIR AND WASTE MANAGEMENT

September 30, 1981

Mr. Jose Ma. R. Concepcion
#30 Melantic Street
San Lorenzo Village Makati
Metro Manila
Republic of the Philippines

Dear Mr. Concepcion:

We have received your application for an EPA evaluation of the "Dynamix" device. Our Engineering Evaluation Group has reviewed your application and has identified several areas that require additional clarifications prior to further processing of your application. The questions are listed below according to the section numbers of your 511 application.

1. Section III, B, Patent Protection. We ask that you submit a copy of RP patent 13218 and the U.S. patent application.

2. Section VIII Description of the device

   A. Section VIII, A. states the device normally operates in the recommended proportions of 30% alcohol to 70% regular gasoline. Is this 30% alcohol the 160 proof hydrous alcohol mixture, or does this mean the alcohol content in the hydrous alcohol mixture is in a ratio of 30% pure alcohol to gasoline?

   B. Section VIII, A. states regular gasoline. Most vehicles in this country use unleaded gasoline.

   C. Section VIII, A. states that a wider range of proportions can be used, including only alcohol and only gasoline. Have modified vehicles been successfully operated only on gasoline? only alcohol? which alcohols? what range of proofs (water content)?

   D. Section VIII, C. states the proportioning valve meters the desired percentage of fuel passing through it. By fuel, I presume you mean gasoline. That is, the amount of gasoline flow is controlled to be a preset ratio of the hydrous alcohol flow rate (normally 70% gasoline to 30% hydrous alcohol). The alcohol flow is controlled solely by the alcohol accelerator valve. Is this correct?

   E. Details of the proportional valve and its controls are needed.

   F. The device appears to restrict the flow of gasoline to a set percentage of the alcohol being consumed. It appears that under most driving conditions, the carburetor float bowl will not be full and in fact may be relatively empty. If this is correct,

the carburetor, idle circuits, accelerator pump, and power enrichment circuits will not function properly. There is apparently no function in the alcohol circuits to take over these functions. Is this correct?

3. Section IX, F. shows the vaporization chamber located in any convenient orifice in the intake manifold or the manifold PCV hole. It appears that this would not give an identical homogenous mixture of air, hydrous alcohol and gasoline to each cylinder for most vehicles. Please comment and provide data.

4. Section X, I. states that for adjusting the device and vehicle, the gasoline flowrate is taken "at a point just below the red-line of the tachometer while the vehicle is in motion". This adjustment procedure is unacceptable. It would require the vehicle to be operated at maximum speed for an extended period and thus present a safety hazard.

If you are able to visit EPA when you come to North America early in November, we could discuss the questions listed in this letter. If you can not come to EPA, we would like to receive answers to these questions by mail by the first of November.

I am enclosing our latest policy documents related to the evaluation of fuel economy and emission control devices.

Sincerely,

Merrill W. Korth, Device Evaluation Coordinator
Test and Evaluation Branch

Enclosure

cc. T. Barth
[redacted]

Recd. 11-3-81
MWK

file DYNAMIX
28

TRICONTECH INC.

Attachment E

October 19, 1981

Mr. Merrill W. Korth
Device Evaluation Coordinator
United States Environmental Protection Agency

Dear Mr. Korth,

Hereunder please find the answers to your queries contained in your letter dated Sept. 30, 1981.

1. Attached please find a photocopy of the Notice of Allowance from the US Patent Office relative subject application and referred to as application no. 115,616 labelled and attached hereto as Annex A. The consolidated and amended claims are contained in the US patent which my lawyers in Washington DC should have by now. I have instructed them to mail you a copy.

2A. This refers to 30% of 160 proof hydrous ethanol to 70% gaoline.

2B. For purposes of this application, we shall refer to unleaded gasoline. Reference must however be made to tests with leaded gasoline in RP.

2C. "Modified" vehicles run normally with pure gasoline. The same vehicles run satisfactorily when in motion and at cruising speeds with 160 proof ethanol. However engine stalls occur at prolonged idling speeds when operating with only 160 proof ethanol.

2D. Your observation is correct, the alcohol flow is controlled by the accelerating valve, after maximum proportions are preset by the proportioning valve.

2E. Attached please find the details of the proportional valve referred to as Annex B.

2F. The proportioning valve does restrict the flow of gasoline at such points where the flow of alcohol is increased sicne the metering valves are diagonally opposed. This is particularly true when cruising at proportions exceeding 50% hydrous alcohol to gasoline. In such a case, when gasoline fuel starvation take place, the increase in alcohol fuel makes up for the energy lost by gasoline. However, quick and easy accelerating valve adjustments are necessary to effect this condition.

The overiding principle in the device is to operate at preset proportions such as 30% hydrous alcohol to 70% gasoline and operate on pure alcohol or liberal proportions thereof on rare but necessary occassions when there is no gasoline.

EXECUTIVE OFFICES: The Manila Hilton, Suites 120 & 135-A, United Nations Ave., Ermita, Metro Manila, Philippines
Telephones: 595-461 . 583-143 . 573-711 ext. 8185 Telex 27920 OPTE PH ATTN: TRICONTECH

TRICONTECH INC.

Item: Likewise, when the intake air is bled thru the device orifice in the intake manifold, there is a proportional drop in carburetor air velocity which in this case is compensated by the alcogas device/ system infusing both heated air and alcohol fuel thru said orifice. It is reasonable to presume therefore that becasue of lessened vacuum pressure and air velocity passing the gasoline carburetor, that a consequential reduction of gasoline fuel would take place.

The orifice size of the intake manifold therefore would enable a given engine to operate efficiently only at certain parameters, that is why it is recommended that for most applications, a 20% to 30% hydrous alcohol to the equivalent gasoline proportion is recommended. On the basis of fixed and present proportions, this factor alone may even set aside the mechanical manipulations in the proportioning valve. This, plus the fact that alcohol contains oxygen, which gasoline does not have.

3. You must be referring to the need to effect a fairly equal distribution of air and fuel alcohol to all the cylinders. This is not a problem when the orifice is located in the center of the intake manifold. Most of the popularly sold cars in the PHILIPPINES (RP) have the orifice in the center of the intake manifold. Whenever the orifice in the intake manifold is not centered, we provide an adapter immediately under the carburetor containing an inlet orifice for the device to effect a more equal distribution of fuel alcohol and heated air to all the cylinders.

4/ There would be a safety hazard at top gears, but we normally take this at the lowest gears. STill, you have a point, irregardless if the monitoring is being taken at crawling sppeds at low gear. We have since, amended the procedure by priorly dterming proportions on chassis dynos on as many representative cars and recommending the desired flow rate for a given application.

Certainly, considerable improvements can still be effected, such as monitoring and computerizing fuel and air deliveries in relation to varied engine loads and speeds. Please allow me to respectfully aver however, that the worldwide concern involves survival considerations in utilizing economically feasible alternatives. The socio-economic implication in suitable alternatives such as cheap alcohol involving and affecting the grain interests (corn, wheat, manioc, sugar, etc. feedstocks) plus the capability of distressed governments to reduce crude oil dependence has now assumed survival considerations. Incidentally, several top oil company executives have expressed satisfaction over this 30% hydrous alcohol compromise. The device can be further improved to exceed this recommedded proportions but the imperatives of international business require a concept of live and let live.

Sincerely,

JOSE MA. R. CONCEPCION

EXECUTIVE OFFICES: The Manila Hilton, Suites 120 & 135-A, United Nations Ave., Ermita, Metro Manila, Philippines
Telephones: 595-461 . 583-143 . 573-711 ext. 8185 Telex 27920 OPTE PH ATTN: TRICONTECH

P.S. I shall be in N.Y. by 1st Wk. of Nov. - allow me to have the pleasure of

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR, MICHIGAN 48105

OFFICE OF
AIR AND WASTE MANAGEMENT

November 19, 1981

Mr. Jose Ma. R. Concepcion
#30 Melantic Street
San Lorenzo Village Markate
Metro Manila
Republic of the Philippines

Dear Mr. Concepcion:

We have received your letter of October 19, 1981 in which you responded to our request for additional information on "Dynamnix". Our Engineering Evaluation Group has reviewed your response and has identified several areas that still require additional clarification prior to further processing of your application. Again, our questions are listed below according to the section numbers of your 511 application.

1. Section III, B, Patent Protection. We ask that you submit a copy of RP patent 13218.

2. Section VIII, Description of the Device.

   A. Section VIII, A, your reply (2C) referred to 160 proof ethanol. I therefore assume your device has not been tested with other alcohols nor is it meant to be used with other alcohols. Is this assumption correct? Your answer also appears to imply the vehicles do not start and accelerate properly when operating on only 160 proof ethanol. Is this assumption correct?

   B. The drawings of the proportioning valve, provided as an attachment to your letter, do not adequately describe the valve and its manner of operation. Please provide a more detailed description of the valve and its method of controlling the flows of ethanol and gasoline.

   C. Your reply (2F) stated "However, quick and easy accelerating valve ...". I presume the accelerating valve here referred to is the alcohol accelerating valve. Is this assumption correct? The function of this accelerating valve appears to be to replace part of the engine's basic fuel requirement. Since the normal supplemental carburetor circuits (idle, accelerator pump, and power enrichment) probably will not function normally due to the reduced flow of gasoline and air into the carburetor, how are these supplemental functions performed by the alcohol accelerating valve.

D. Your reply (2F) states "On the basis of fixed and present proportions, this factor alone may even set aside the mechanical manipulations in the proportioning valve. This, plus the fact that alcohol contains oxygen, which gasoline does not have." The meaning of this statement is not clear. Please describe more fully what is meant by this statement.

E. Your reply (3) states that mixture distribution is not a problem when using the orifice located at the center of the intake manifold. Please provide data or other information to support this statement.

3. Section IX, Device Installation

A. Your reply (3) refers to a carburetor adapter. For which makes/models/years of vehicles sold in the U.S. do you provide adapters? Is the appropriate adapter supplied with the device? Which makes/models/years of vehicles sold in the U.S. can use the device without an adapter?

B. Your reply (4) states you have modified the recommended installation adjustment procedures. What are the proportions recommended for each make/model/year of vehicle? Please list. Does the installer simply dial in this value? Are adjustments required to be performed on a chassis dynamometer? Are road adjustments required? Please provide a copy of the current installation instructions as provided with the device.

What is the suggested retail price of Dynamix?

What parts are supplied with the Dynamix device, e.g., accelerating valve, electric fuel pump, heat exchanger, carburetor adapter, hoses, fittings, wiring, etc.

Again, I welcome the opportunity to personally discuss these questions with you if you have the opportunity to visit EPA in November. If you cannot come to EPA, we would like to receive answers to these questions by mail by December 4th.

Sincerely,

Merrill W. Korth, Device Evaluation Coordinator
Test and Evaluation Branch

cc: Dynamix File

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR, MICHIGAN 48105

OFFICE OF
AIR AND WASTE MANAGEMENT

January 11, 1982

Mr. Jose Ma.R. Concepion
#30 Melantic Street
San Lorenzo Village Makati
Metro Manila
Republic of the Phillipines

Dear Mr. Concepcion:

We received your letter of October 19, 1981 in which you responded to our request for information on your "Dynamix" device. As I noted in my letter of November 19, 1981 (copy enclosed) we still require additional information prior to further processing of your application. Please provide the requested information immediately.

The Environmental Protection Agency is obligated to expeditously process your application. However, the information you previously submitted does not adequately describe your device and does not include valid test data following the proper EPA test procedures. The limited information you provided does not show a benefit for your device. Therefore, we presently have insufficient technical information to adequately evaluate your claims for the device.

Unless I receive a satisfactory response by February 5, 1982, we will complete the evaluation of your device using the information that is currently available.

Again, I welcome the opportunity to answer your questions and to work with you in designing a test plan to test your device at an independent laboratory here in the United States. However, I will need the requested information to efficently assist you.

Please contact me immediately if you do not understand this course of action.

Sincerely,

Merrill W. Korth
Device Evaluation Coordinator
Test Evaluation Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR, MICHIGAN 48103

OFFICE OF
AIR AND WASTE MANAGEMENT

February 11, 1982

Mr. Jose Ma. R. Concepcion
#30 Melantic Street
San Lorenzo Village Makati
Metro Manila
Republic of the Philippines

Dear Mr. Concepcion:

We received your telegram of February 1 in which you stated that you had just learned of our request for information on "Dynamix" as contained in our recent two letters. You also indicated that you had not received the actual request contained in our letter of November 19, 1981. Although a copy of the letter of November 19 was to be enclosed with the letter of January 11, apparently you did not receive it. I am therefore enclosing a copy of both these letters.

Your telegram also stated that you expect to return to the United States in March to run tests on your device. Again, I welcome the opportunity to answer your questions and to work with you in designing a test plan for testing your device at an independent laboratory in this country. However, I will need the requested information to efficiently assist you and ask that you respond to my letters of November 19 and January 11 by March 19.

Because of the problems we have had with the mails, please notify me by telegram as soon as you receive this letter.

Sincerely,

Merrill W. Korth
Device Evaluation Coordinator
Test and Evaluation Branch

Enclosure

ANN ARBOR MICHIGAN 4810

March 26, 1982

Mr. Jose Ma. R. Concepcion
Tricontech, Incorporated
Manila Hilton Hotel, Suite 135A
United Nations Avenue
Ermita, Metro Manila
PHILIPPINES

Dear Mr. Concepcion:

I am enclosing copies of three letters that we sent to you previously on November 19, 1981, January 11, 1982, and February 11, 1982. During our telephone conversation on March 25 you did not seem to recall what correspondence you had received from EPA.

We are discouraged that you have not been able to respond to our letters nd answer our questions, especially the questions posed in our letter date d November 19. Your application for an EPA evaluation of your device dates back to September 10, 1981 and we have made no significant progress.

We are considering completing our evaluation with the information at hand at this point. In that situation, you could reapply at a later date whan you will be nearer to the point of developing scientific data to demonstrate the effectiveness of your device. I would be happy to comment on the suitability of your test plans at any time.

Please let me know if you have any questions concerning these actions.

Sincerely,

Merrill W. Korth, Device Evaluation Coordinator
Test and Evaluation Branch

Enclosures (3)

cc: Dynamix File
J. White/A. Barth

April 20, 1982

Mr. Jose Ma. R. Concepcion
Tricontech, Incorporated
Manila Hilton Hote, Suite 135A
United Nations Avenue
Erminta, Metro Manila
PHILIPPINES

Dear Mr. Concepcion:

We still lack several critical pieces of information before we can properly evaluate "Dynamix". As explained in our earlier letters and telephone conversations, we are obligated to publish our evaluation in the Federal Register. We cannot delay that action indefinitely. Therefore, I am forced to complete our evaluation and publish our conclusions with the information at hand.

The most important information we lack is substantive test data to support your claims for the device. We have yet to see your test plan for the test program you are about to initiate. As we explained, if we do not have the opportunity to review your plan, you run the risk of an oversight that might invalidate your whole effort. We recognize that such testing is expensive and want to ensure that your testing will meet our needs.

The other important pieces of information are the details of the device description and installation instructions. We originally requested that information in our letter of November 18 and have reiterated the request in subsequent correspondence.

Because of the inordinate amount of time that has passed since we first received your application and the difficulties encountered in getting the information in proper form for us to analyze, we are faced with the need to establish a deadline. That deadline is May 21. At that time, we will conclude our evaluation, with or without the requested information. We believe that that date allows more than enough time for our review of your plan and the conduct of the test program at an independent laboratory. At least three vehicles should be tested. If the data from the independent laboratory indicate a meaningful fuel economy or emission benefit, EPA will perform confirmatory tests even though you may not wish to fully disclose the detailed description of your device.

Please let us know when you send us the test plan what laboratory you have selected and the scheduled dates for your testing. If you have any questions about these requirements, please contact me immediately at (313) 668-4299.

Sincerely,

/s/

Merrill W. Korth, Device Evaluation Coordinator
Test and Evaluation Branch